

CLAIMS

What is claimed is:

1. A method for screening mobile application part (MAP) messages, the method comprising:
5 in a transit network:
 - (a) receiving, from a first network, a first signaling message containing MAP protocol information and signaling connection control part (SCCP) information;
 - (b) extracting a first called party address from the SCCP information;
 - 10 (c) determining whether the first called party address matches first SCCP screening criteria for a destination network;
 - (d) in response to determining that the first called party address matches the first SCCP screening criteria, extracting a MAP opcode from the MAP protocol information and determining
15 whether the MAP opcode indicates a targeted message type; and
 - (e) in response to determining that the MAP opcode indicates a targeted message type, performing a screening action.
2. The method of claim 1 wherein determining whether the first called party address matches the first SCCP screening criteria includes determining
20 whether the first called party address falls within a range of called party addresses corresponding to the destination network.
3. The method of claim 1 wherein determining whether the first called party address matches first SCCP screening criteria includes determining

whether the first called party address corresponds to a called party address that has been ported into the destination network.

4. The method of claim 1 wherein determining whether the first called party address matches first SCCP screening criteria includes determining
5 whether the first called party address corresponds to a called party address that has been ported out of the destination network.
5. The method of claim 1 wherein determining whether the MAP opcode indicates a targeted message type includes determining whether the MAP opcode indicates an anytime interrogation message.
- 10 6. The method of claim 1 wherein determining whether the MAP opcode indicates a targeted message type includes determining whether the MAP opcode indicates a location update message.
7. The method of claim 1 wherein determining whether the MAP opcode indicates a targeted message type includes determining whether the
15 MAP opcode indicates a short message service (SMS) message.
8. The method of claim 1 comprising extracting a first calling party address from the first signaling message and determining whether the first calling party address matches the SCCP screening criteria for the destination network.
- 20 9. The method of claim 8 wherein performing the screening action comprises performing the screening action in response to determining that the first calling and called party addresses both match the first SCCP screening criteria and that the MAP opcode indicates a targeted message type.

10. The method of claim 1 comprising:
 - (a) receiving a second signaling message having a second called party address;
 - (b) determining whether the second called party address matches
5 second SCCP screening criteria, the second SCCP screening criteria being different from the first SCCP screening criteria;
 - (c) in response to determining that the second called party address matches the second SCCP screening criteria, determining whether the second signaling message is a targeted MAP
10 message type; and
 - (d) in response to determining that the second signaling message is a targeted MAP message type, performing a screening action.
11. The method of claim 1 wherein performing the screening action includes dropping the message.
- 15 12. The method of claim 1 wherein performing the screening action includes generating billing information based on the message.
13. A method for screening mobile application part (MAP) messages that are not sent route on global title, the method comprising:
 - (a) receiving a signaling message;
 - 20 (b) determining whether the signaling message contains MAP protocol information;
 - (c) in response to determining that the signaling message contains MAP protocol information, extracting an international mobile station identifier (IMSI) from the signaling message;

- (d) determining whether the IMSI matches IMSI-based screening criteria for a destination network;
 - (e) in response to determining that the message matches the IMSI-based screening criteria, determining whether the signaling message is a targeted MAP message type; and
 - (f) in response to determining that the signaling message is a targeted MAP message type, performing a screening action.
14. The method of claim 13 wherein receiving a signaling message includes receiving a signaling message in the transit network located between first network and the destination network.
15. The method of claim 13 wherein determining whether the IMSI matches IMSI-based screening criteria includes determining whether the IMSI falls within a range of IMSIs for the destination network.
16. The method of claim 13 wherein determining whether the IMSI matches IMSI-based screening criteria includes determining whether the IMSI matches an IMSI corresponding to a subscriber who has been ported into the destination network.
17. The method of claim 13 wherein determining whether the IMSI matches an IMSI corresponding to a subscriber who has been ported out of the destination network.
18. The method of claim 13 wherein determining whether the signaling message is a targeted MAP message type includes decoding a MAP opcode.

19. The method of claim 13 wherein determining whether the signaling message is a targeted MAP message type includes determining whether the signaling message is an anytime interrogation message.
20. The method of claim 13 wherein determining whether the signaling message is a targeted MAP message type includes determining whether the signaling message is a location update message.
21. The method of claim 13 wherein determining whether the signaling message is a targeted MAP message type includes determining whether the signaling message is a short message service (SMS) message.
22. The method of claim 13 wherein performing a screening action includes dropping the message.
23. The method of claim 13 wherein performing a screening action includes extracting and storing information from the message.
24. A signaling message routing node including transit network mobile application part (MAP) screening functionality, the signaling message routing node comprising:
 - (a) a first module for sending and receiving signaling messages between first and second networks, wherein the first module is adapted to identify signaling connection control part (SCCP) messages from the signaling messages; and
 - (b) a second module operatively associated with the first module for receiving the identified SCCP messages, for applying destination-network-based SCCP screening criteria to the signaling messages, and, for each message matching the destination-

network-based SCCP screening criteria, for applying MAP-based screening criteria.

25. The signaling message routing node of claim 24 wherein the first module comprises an SS7 signaling link interface module for sending
5 and receiving SS7 messages over an SS7 network.
26. The signaling message routing node of claim 24 wherein the first module comprises an IP interface module for sending and receiving IP based signaling messages over an IP network.
27. The signaling message routing node of claim 24 wherein the second
10 module is adapted to extract an SCCP called party address from each SCCP message and to determine whether the called party address falls within a range of called party addresses for the destination network.
28. The signaling message routing node of claim 24 wherein the second
15 module is adapted to extract an SCCP called party address from each SCCP message and to determine whether the called party address corresponds to an individual called party address that has been ported into the destination network.
29. The signaling message routing node of claim 24 wherein the second
20 module is adapted to extract an SCCP called party address from each SCCP message and to determine whether the called party address corresponds to an individual called party address that has been ported out of the destination network.
30. The signaling message routing node of claim 24 wherein the second module is adapted to determine whether each SCCP message that

matches the destination-network-based screening criteria is a targeted MAP message type.

31. The signaling message routing node of claim 30 wherein the targeted MAP message type includes anytime interrogation.
- 5 32. The signaling message routing node of claim 30 wherein the targeted MAP message type includes location update.
33. The signaling message routing mode of claim 30 wherein the targeted MAP message type includes short message service.
34. The signaling message routing node of claim 24 wherein the second
10 module is adapted to drop MAP messages that match the MAP and SCCP screening criteria.
35. The signaling message routing node of claim 24 wherein the second module is adapted to store information relating to MAP messages that match the MAP and SCCP screening criteria.
- 15 36. The signaling message routing node of claim 24 wherein the second module is adapted to apply different destination-network-based screening criteria for different destination networks.
37. The signaling message routing node of claim 24 wherein the second module is adapted to apply SCCP calling party screening criteria to the
20 identified SCCP messages.
38. The signaling message routing node of claim 24 wherein the second module is adapted to apply IMSI-based screening criteria to received MAP messages.

39. The signaling message routing node of claim 24 wherein the first and second modules are components of a signal transfer point (STP).
40. The signaling message routing node of claim 39 wherein the STP includes a distributed internal processing architecture in which signaling
5 link interface functions are performed by a separate processor from
MAP and SCCP screening functions.